

WHAT IS CLAIMED IS:

1. A ground fault detection apparatus for detecting a ground fault of a solar battery in a solar power generation system which causes a non-insulated type inverter to convert DC power generated by the solar battery into AC power and outputs the AC power to a commercial power system, comprising:

differential current detection means for detecting a differential current between output lines of the solar battery;

AC leakage current removing means for removing an AC leakage current component due to a capacitance to ground of the solar battery from the differential current; and

determination means for determining whether a ground fault state has occurred by comparing a current value output from said AC leakage current removing means with a predetermined threshold value.

2. The apparatus according to claim 1, wherein said AC leakage current removing means removes a frequency component twice a frequency of the commercial power system from the differential current.

3. The apparatus according to claim 1, wherein said AC leakage current removing means calculates a prediction value of an AC leakage current from a voltage variation amount of the output line of the solar battery and the capacitance to ground of the

solar battery and subtracts the prediction value from a value of the differential current.

4. The apparatus according to claim 1, wherein said AC leakage current removing means calculates a

5 prediction value of an AC leakage current from a voltage variation amount of a booster section of the non-insulated type inverter and the capacitance to ground of the solar battery and subtracts the prediction value from a value of the differential  
10 current.

5. The apparatus according to claim 1, wherein said AC leakage current removing means calculates a prediction value of an AC leakage current from an output power amount of the non-insulated type inverter  
15 and the capacitance to ground of the solar battery and subtracts the prediction value from a value of the differential current.

6. The apparatus according to claim 1, wherein said AC leakage current removing means includes filter means  
20 for removing a PWM component of the non-insulated type inverter from the differential current.

7. A solar power generation system comprising:  
a ground fault detection apparatus for detecting a ground fault of a solar battery in a solar power  
25 generation system which causes a non-insulated type inverter to convert DC power generated by the solar battery into AC power and outputs the AC power to a

commercial power system, including,

differential current detection means for detecting a differential current between output lines of the solar battery,

5 AC leakage current removing means for removing an AC leakage current component due to a capacitance to ground of the solar battery from the differential current, and

determination means for determining whether  
10 a ground fault state has occurred by comparing a current value output from said AC leakage current removing means with a predetermined threshold value; and

control means for controlling operation of said  
15 non-insulated type inverter and a state of a system interconnection switch in accordance with a determination result from said ground fault detection apparatus.

8. A ground fault detection method of detecting a  
20 ground fault of a solar battery in a solar power generation system which causes a non-insulated type inverter to convert DC power generated by the solar battery into AC power and outputs the AC power to a commercial power system, comprising the steps of:

25 detecting a differential current between output lines of the solar battery;

removing an AC leakage current component due to a

capacitance to ground of the solar battery from the differential current; and

determining whether a ground fault state has occurred by comparing a current value after removal of  
5 the AC leakage current component with a predetermined threshold value.

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